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| 09/930,548 | 08/15/2001 | Stephen Suryaputra | 120-179 | 9857 |

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| EXAMINER | |
|---|---|
| GREY, CHRISTOPHER P | |
| ART UNIT | PAPER NUMBER |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/930,548 | SURYAPUTRA ET AL. | |
| | Examiner | Art Unit | |
| | Christopher P. Grey | 2616 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *02 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-3,5-8,10-20,22-25,27-40,42 and 44-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-3,5-8,10-17,24 and 28* is/are allowed.

6)☒ Claim(s) *18-20,22-23,25,27,29-37,42 and 44-47* is/are rejected.

7)☒ Claim(s) *38-40* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerla et al. (Fault Tolerant PON Topologies), hereinafter referred to as Gerla in view of Liu (US 5914798).

**Claim 18** Gerla discloses designating at least one back-up end-system to the primary end-system **(page 0051, 3, a station can reach the root of the tree via 2 separate links, 1st link is primary and 2nd link is backup, disjoint paths)**;

Gerla discloses constructing a failover tree **(page 0051. redundant tree topology, see fig 3a and 3b)** through the optical communication system to the at least one backup end system prior **(R tree and L tree are already constructed prior to failure, see figs 3a and 3b; page 0052, 4, if a failure hits the L-link, then the backup path is the path on the R-tree)** to a detection of a degradation or failure affecting the primary end-system **(page 0052, 4, if a failure hits the L-link)**;

Gerla discloses determining a root node for the failover tree; and constructing the failover tree rooted at the root node (**R and L trees are formed at the root node disclosed in fig 4)**.

Gerla does not specifically disclose wherein the failover construction logic is operably coupled to construct the failover tree rooted at the root node by sending a setup request message specifying a failover trees structure to various nodes in the optical communication network.

Liu discloses wherein the failover construction logic is operably coupled to construct the failover tree rooted at the root node by sending a setup request message specifying a failover trees structure to various nodes in the optical communication network (see fig 6c, wherein Liu depicts the source or root node, sending a message to the alternate node, where this message indicates a confirmation of the alternate or failover path, and is equivalent to a request, in that as a result of the message, a setup 784 is performed. The claim does not define a failover tree, or what is meant by structure, thus the claim is interpreted in its broadest sense).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the teachings of Gerla, so as to perform signaling as disclosed by Liu. The motivation for this modification is to prevent errors in switching, and employ a confirmation and acknowledgement procedure.

**Claim 19** Gerla does not specifically disclose receiving a setup request from the protected end-system specifying the at least one backup end system.

Liu discloses receiving a setup request from the protected end-system specifying the at least one backup end system **(fig 7, 803, determining an alternate path involves sending a request to the database 805, and retrieving an alternate path)**.

It would have been obvious to one of the ordinary skill in the art at the time of the invention that in the event of a failure as disclosed by Gerla, some form of indication of the switching to a backup path is necessary prior to failover. The motivation for this is fast failover and reduced latency of transmission (inherent in the art).

**Claim 20** Gerla discloses the L and R trees being setup prior to failure **(R tree and L tree are already constructed prior to failure, see figs 3a and 3b)**, where in the event of failure, a backup path is automatically used **(page 0052, 4, if a failure hits the L-link, then the backup path is the path on the R-tree).**

2. Claims 22-23, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerla et al. (Fault Tolerant PON Topologies) in view of Liu (US 5914798).
in view of Lamport (US 5138615)

**Claim 22** Gerla discloses completely switching from a first path to a second path as disclosed in the rejection of claims 1 and 18. Gerla does not specifically disclose identifying a candidate node within a predetermined distance; constructing a shortest path spanning tree from the candidate node to the back up system, and selecting the candidate node as the root node.

Lamport discloses each node within the spanning tree being a possible (candidate) root node (Col 39 lines 41-50).

Lamport discloses each switch (node) determining its position in the spanning tree (Col 39 lines 10-28). Lamport also discloses a preferred path being the shortest legal path (Col 9 lines 28-33 and Col 8 lines 64-67). Lamport discloses the process of

reconfiguration as disclosed in the rejection of claims 4, 21 and 36, where it would have been obvious to one of the ordinary skill in the art at the time of the invention to implement the shortest path determined from analyzing the spanning tree from an alternate node to the end system.

Lamport discloses the switches agreeing (selecting) on the identity of the root node (Col 39 lines 10-50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover procedure as disclosed by Beardsley, to determine a root node as disclosed by Lamport. The motivation for this modification is to implement a root node, which assists in reconfiguration (Col 6 lines 15-21).

**Claim 23** Gerla does not disclose using a marking scheme to identify the candidate node. Lamport discloses using a node ranking (marking), where each switch is ranked based on how close it is to the root node (Col 3 lines 14-18).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover procedure as disclosed by Gerla, to use a ranking rule as disclosed by Lamport. The motivation for this modification is to monitor how close each node is, assisting in determining a shortest path on reconfiguration.

**Claim 25** Gerla does not disclose constructing the shortest spanning tree from the candidate node to the back up end system based upon topology information.

Lamport discloses finding a shortest path (Col 9 lines 20-33 and lines 15-20), where this path is related to a spanning tree (Col 6 lines 4-12). Lamport also discloses

using the spanning tree to perform reconfiguration, where reconfiguration involves updating topology information (Col 34 lines 5-17 and Col 3 lines 35-44).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley, to recomputed the paths within the spanning tree in order to update the changes in the topology of the network (Col 39 lines 10-27).

3. Claims 27, 29, 30, 32, 34-36, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerla et al. (Fault Tolerant PON Topologies) in view of Frey et al. (US 5252288), hereinafter referred to as Frey.

**Claim 27, 29, 30, 32,44** Gerla discloses determining a root node for the failover tree; and constructing the failover tree rooted at the root node (**R and L trees are formed at the root node disclosed in fig 4**).

Gerla discloses constructing a failover tree **(page 0051. redundant tree topology, see fig 3a and 3b)** through the optical communication system to the at least one backup end system prior **(R tree and L tree are already constructed prior to failure, see figs 3a and 3b; page 0052, 4, if a failure hits the L-link, then the backup path is the path on the R-tree)** to a detection of a degradation or failure affecting the primary end-system **(page 0052, 4, if a failure hits the L-link)**;

Gerla does not specifically disclose recording the failover tree in a database and signaling logic operably coupled to send release message upstream toward the root node over the failover tree when the detection logic detects the degradation or failure

affecting the primary end system to release light path resources to the primary end system.

Frey discloses recording the failover tree in a database **(Col 7 lines 18-22, obtaining an alternate destination from a database, where the alternate destination is equivalent to the failover tree)** and signaling logic operable coupled to send release message upstream toward the root node over the failover tree when the detection logic detects the degradation or failure affecting the primary end system to release light path resources to the primary end system **(abstract, indication that the call cannot be completed is sent to switch).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the nodes as disclosed by Gerla, so as to indicate the state of congestion, thus allowing the root nodes to perform alternate routing. The motivation for this modification is for congestion recovery.

**Claim 29** Gerla discloses relinquishing lightpath resources by a number of nodes from the failover node to the primary end system **(see fig 3b, this tree represents the backup path from the failover nodes, where the nodes within this tree relinquish their resources).**

**Claim 34** Gerla discloses the L and R trees being setup prior to failure **(R tree and L tree are already constructed prior to failure, see figs 3a and 3b)**, where in the event of failure, a backup path is automatically used **(page 0052, 4, if a failure hits the L-link, then the backup path is the path on the R-tree).**

**Claim 35, 36** Gerla discloses determining a root node for the failover tree; and constructing the failover tree rooted at the root node (**R and L trees are formed at the root node disclosed in fig 4)**.

4. Claims 31,33,37,42,45,46,47,are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerla et al. (Fault Tolerant PON Topologies) in view of Frey et al. (US 5252288), hereinafter referred to as Frey in view of Lamport (US 5138615)

**Claim 42,46,47** Gerla discloses the detection of a failure as disclosed in the rejection of claim 1 and 27. However, Gerla does not specifically disclose monitoring a bearer channel between the primary end system and a corresponding edge node and querying the primary end system.

Lamport discloses monitoring links, and detecting the failure of any part of the network (Col 33 line 60 – Col 34 line 4).

Lamport discloses the reconfiguration program (optical service agent) continually monitoring (querying) the link units in a switch, and detecting any fault within the network.

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the detection of a failure as disclosed by Gerla, with the monitoring mechanism as disclosed by Lamport in order to effectively and automatically detect and recover from a failure.

**Claim 31, 33, 45** Gerla does not disclose sending a lightpath setup request by the failover node downstream toward the backup lightpath.

Lamport discloses in the event of reconfiguration, which is triggered by a failure, a switch sending to all of its neighboring nodes a message indicating its reconfiguration (Col 39 lines 10-28).

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switching procedure as disclosed by Gerla to indicate via a message or request that a failure has occurred and that there is a need for switching over to a back up path. The motivation for this modification is to ensure that a backup path is available and indicate to the backup end system that a failure has occurred and switching is necessary.

**Claim 37** Gerla discloses completely switching from a first path to a second path as disclosed in the rejection of claims 1 and 18. Gerla does not specifically disclose identifying a candidate node within a predetermined distance; constructing a shortest path spanning tree from the candidate node to the back up system, and selecting the candidate node as the root node.

Lamport discloses each node within the spanning tree being a possible (candidate) root node (Col 39 lines 41-50).

Lamport discloses each switch (node) determining its position in the spanning tree (Col 39 lines 10-28). Lamport also discloses a preferred path being the shortest legal path (Col 9 lines 28-33 and Col 8 lines 64-67). Lamport discloses the process of reconfiguration as disclosed in the rejection of claims 4, 21 and 36, where it would have been obvious to one of the ordinary skill in the art at the time of the invention to

implement the shortest path determined from analyzing the spanning tree from an alternate node to the end system.

Lamport discloses the switches agreeing (selecting) on the identity of the root node (Col 39 lines 10-50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover procedure as disclosed by Beardsley, to determine a root node as disclosed by Lamport. The motivation for this modification is to implement a root node, which assists in reconfiguration (Col 6 lines 15-21).

***Allowable Subject Matter***

5. Claims 1-3, 5-8 and 10-17, 24 and 28 are allowed.

Claims 38 and 39 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P. Grey whose telephone number is (571)272-3160. The examiner can normally be reached on 10AM-7:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on (571)272-7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Christopher Grey
Examiner
Art Unit 2616
10/16/07

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